

(19) World Intellectual Property Organization
International Bureau



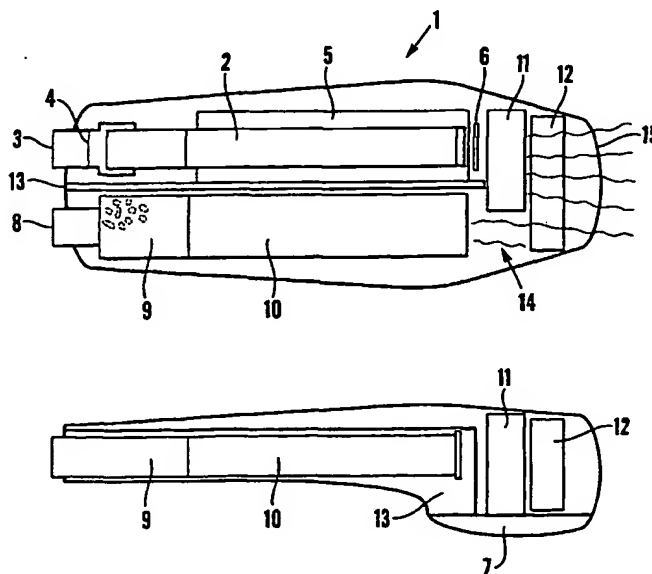
(43) International Publication Date
20 September 2001 (20.09.2001)

PCT

(10) International Publication Number
WO 01/67899 A1

- (51) International Patent Classification⁷: **A24F 13/00**
- (21) International Application Number: **PCT/GB00/03256**
- (22) International Filing Date: **24 August 2000 (24.08.2000)**
- (25) Filing Language: **English**
- (26) Publication Language: **English**
- (30) Priority Data:
0006089.7 14 March 2000 (14.03.2000) **GB**
- (71) Applicant and
(72) Inventor: **CHALLENGER, Michael [GB/—]; Mimosa,**
Havre de Rozel, Trinity, Jersey JE3 5BN (GB).
- (81) Designated States (*national*): AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report
- (74) Agents: **LOVEN, Keith, James et al.; Loven & Co.,**
Quantum House, 30 Tentercroft Street, Lincoln LN5 7DB (GB).
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **SELF-CONTAINED PERSONAL SMOKING UNIT**



(57) Abstract: A personal smoking unit comprises a housing (1) adapted to be opened to gain access to the interior thereof, a compartment within the housing to locate a cigarette, cigar etc. (2) and filter means (9, 10) within the housing adapted to filter combustion products from a lit cigarette within the housing. The housing has inhale and exhale mouthpieces (3, 8) and air inlets (18). One or more fans (11) assist movement of combustion products out of the housing through first and second charcoal filters (10, 12) and possibly a moisture filter (9). A glow bar (6) may be provided to light the cigarette and may be manually operated by a switch (16). All the necessary power may be provided by one or more batteries in a separate compartment. The housing may be opened to remove ash and load a new cigarette. The whole device need be no larger than a TV remote control handset.

WO 01/67899 A1

SELF-CONTAINED PERSONAL SMOKING UNIT

Field of the Invention

This invention relates to a self-contained, portable unit enabling a smoker to smoke a cigarette without encroaching on the environment of others.

5 Background to the Invention

It is undeniable that, nowadays, cigarette smoking has become less socially acceptable than it was a couple of decades ago. Smoking in public places, such as on certain types of public transport, and in places of entertainment, such as restaurants, cinemas etc is discouraged if not prohibited.

10 For those who either cannot or do not wish to stop smoking, social attitudes to smokers can make them feel as though they are second-class citizens. The situation is perhaps considerably worse for smokers who, through business or social commitments, have to travel extensively at home and/or abroad, where the social acceptability of cigarette smoking varies from place to place.

15 Summary of the Invention

The inventor has therefore devised a unit which will allow the user to smoke in such a way that there is no, or substantially no discharge into the air of the usual products of smoking, especially smoke and carbon monoxide. The unit will allow the user to both inhale and exhale as in normal smoking.

20 Accordingly, the invention provides a personal smoking unit comprising:

- (a) a housing; adapted to be opened to gain access to the interior thereof;
- (b) a compartment within the housing to locate a cigarette; and
- (c) filter means within the housing adapted, in use, to filter combustion products from a lit cigarette within the housing.

25 Preferably, the cigarette is located in the compartment with an end adjacent an inhale mouthpiece by which the user may inhale smoke from the cigarette.

The unit preferably also comprises an exhale mouthpiece through which the user may exhale the previously inhaled smoke from the cigarette.

30 The filter means is preferably arranged to filter both the smoke emanating naturally from the lit end within the housing and the exhaled smoke blown into the housing through the exhale mouthpiece.

- 2 -

Advantageously, the filter means includes one or more replaceable filter units, for example containing active charcoal and/or other filter media.

The filter means may also incorporate a moisture filter to extract moisture from the exhaled smoke upstream of the filter.

5 A further charcoal or other filter may be located adjacent an outlet from the housing.

The unit may also be provided with means to extract smoke-laden air from within the housing.

10 The extraction means preferably comprises one or more fans located upstream of the outlet from the housing.

An extraction fan may be located each side of the further filter, in the direction of air flow out of the housing. For most applications, a single fan will suffice.

15 The fan or fans is/are preferably driven by electric motor(s) located within the housing. A battery or batteries for the motor(s) may also conveniently be located within the housing.

The battery or batteries may also power a glow bar positioned adjacent the inner end of a cigarette located in the said compartment and adapted to light the cigarette. A switch is preferably provided to operate the glow bar.

20 The housing is also preferably provided with air inlet means to enable air to enter the housing so as to allow the cigarette to burn. The air inlet means may conveniently consist of one or more openings in the side of the housing. Each opening is preferably provided with a one-way valve to prevent combustion products from escaping the housing.

25 There is preferably also provided adjacent the inhale mouthpiece a non-return valve which can be operated by the user in order to open a passageway within the inhale mouthpiece, thereby allowing the user to inhale from the cigarette, or which can be automatic in operation. Alternatively, an automatic one-way valve may be positioned within the inhale mouthpiece.

- 3 -

Brief Description of the Drawings

A description of particular embodiments of the personal smoking unit will now be given with reference to the Figures of the drawing in which:

Fig 1 shows a schematic view of a first embodiment of the unit;

5 Fig 2 shows a schematic view of a second embodiment of the unit ;

Fig 3 shows a schematic view of a third embodiment of the unit.

Detailed Description of the Illustrated Embodiments

Referring now to Fig 1, the unit consists of a housing 1. This may be the size of a mobile telephone or an average remote control for a television, for example, with typical
10 dimensions of 160mm long, 45mm wide and 20mm deep. These dimensions are purely illustrative and other suitable dimensions may be chosen instead. The housing has a lid or removable section allowing access to a cigarette compartment within the housing into which a cigarette 2 may be inserted by the user. One end of the cigarette, which would be the end with a filter tip, if provided, is inserted into the inner end of an inhale
15 mouthpiece 3. In this embodiment, the mouthpiece 3 is fitted with an internal one-way valve 4 which only opens when the user "draws" on the cigarette to inhale, thereby allowing the smoke from the cigarette to pass into the user's mouth.

The cigarette is cradled by a ceramic heat-absorbing liner 5. Adjacent the opposite end of the cigarette from the mouthpiece is positioned a glow-bar lighter, similar to
20 those commonly found in car "cigar-lighters", and which is adapted to be operated at will by the user to light a cigarette within the housing. A battery compartment 7 is provided in the underside of the housing to power the glow-bar and extraction fans as will become apparent later.

Alongside the inhale mouthpiece is an exhale mouthpiece 8 into which the use
25 blows the smoke previously inhaled through the inhale mouthpiece. Smoke blown back into the housing in this way first passes through a moisture filter 9 to remove or at least reduce the moisture contained within the smoke. Immediately after the moisture filter is a first charcoal filter 10 to remove noxious products, especially carbon monoxide, from the smoke.

30 The filtered smoke emerging from the filter then passes into an exit region, generally indicated at 14, in which a fan and its motor 11 and a second filter 12, eg of char-

- 4 -

coal, are located. The fan creates a pressure gradient within the housing which is sufficient to expel clean air from the housing through a suitable orifice or orifices 15. It should also be noted that the inhale and exhale sides of the housing are at least partially separated by a partition 13 extending longitudinally of the housing.

5 Referring now to Fig 2, there is shown a second embodiment of the unit. For the sake of simplicity, the same reference numerals have been used to denote the same functional items as in the first embodiment.

In this second embodiment a spring-loaded, manually-operable valve 16 replaces the automatic valve 4 in Fig 1. The user would have to operate the valve 16 as and
10 when he or she wishes to inhale. Releasing the plunger of the valve allows it to close under the action of the return spring shown schematically at 17.

The side wall of the housing nearest the cigarette compartment is provided with one or more one-way inlet valves 18 to allow the ingress of air into the housing to aid combustion of the cigarette. In addition, the exit region 14 of the housing includes a
15 pair of fans and their motors 11a and 11b, one upstream and one downstream of the second filter 12. The combined action of the two fans 11a and 11b improves airflow through the unit.

In the third embodiment shown in Fig 3, the housing 1 is provided internally with a manual valve 16 and one or more air inlets 18, as in the second embodiment,
20 and a single fan and motor at the exit region 14, as in the first embodiment.

The effectiveness of any of the devices described above is such that a unit containing a lighted cigarette could safely be placed in the pocket of the user.

After the cigarette has burned out, the housing may simply be opened and the ashes safely disposed of in a suitable receptacle in readiness for a new cigarette. It is
25 expected that the charcoal filter would need replacing after approximately 100 cigarettes. The housing is therefore designed to enable the spent filters to be readily removed and new replacements inserted in their place.

Other variations on the constructions and arrangements described in the first, second and third embodiments may be possible and are included within the scope of
30 this invention. For instance, although the invention has been described solely with reference to cigarettes, it could apply equally to cigars or the like. In this case, it would

- 5 -

simply be necessary to ensure that the housing is of such a size and shape to accommodate a cigar etc in the appropriate compartment and that the other components of the unit are suitable to achieve satisfactory filtering.

- 6 -

CLAIMS

1. A personal smoking unit comprising:
 - (a) a housing, adapted to be opened to gain access to the interior thereof;
 - (b) a compartment within the housing to locate a cigarette; and
 - 5 (c) filter means within the housing adapted, in use, to filter combustion products from a lit cigarette within the housing.
2. A personal smoking unit according to claim 1, wherein the cigarette is adapted to be located in the compartment with an end adjacent an inhale mouthpiece by which the user may inhale smoke from the cigarette.
- 10 3. A personal smoking unit according to claim 1 or claim 2, wherein the unit also comprises an exhale mouthpiece through which the user may exhale the previously inhaled smoke from the cigarette.
4. A personal smoking unit according to claim 3, wherein the filter means is arranged to filter both the smoke emanating naturally from the lit end of a cigarette
- 15 within the housing and the exhaled smoke blown into the housing through the exhale mouthpiece.
5. A personal smoking unit according to any preceding claim, wherein the filter means includes one or more replaceable filter units, for example containing active charcoal and/or other filter media.
- 20 6. A personal smoking unit according to any preceding claim, wherein the filter means incorporate a moisture filter to extract moisture from the exhaled smoke upstream of the filter.
7. A personal smoking unit according to claim 6, wherein a further charcoal or other filter is located adjacent an outlet from the housing.
- 25 8. A personal smoking unit according to any preceding claim, wherein the unit is provided with means to extract smoke-laden air from within the housing.
9. A personal smoking unit according to claim 8, wherein said extraction means comprises one or more fans located upstream of an or the outlet from the housing.

- 7 -

10. A personal smoking unit according to claim 9 as dependant on claim 7, wherein a said extraction fan is located one each side of the said further filter, in the direction of air flow out of the housing.

11. A personal smoking unit according to claim 9 or 10, wherein the fan or
5 fans is/are driven by electric motor(s) located within the housing.

12. A personal smoking unit according to claim 11, wherein the housing is adapted to receive a battery or batteries for the motor(s).

13. A personal smoking unit according to any preceding claim, further comprising a glow bar positioned adjacent the inner end of a cigarette located in the said
10 compartment and adapted to light the cigarette.

14. A personal smoking unit according to claim 13, wherein the glow bar is adapted to be powered by one or more batteries.

15. A personal smoking unit according to claim 14, further comprising a switch to operate the glow bar.

16. A personal smoking unit according to claim 13 or 14, when dependant
15 on claim 12, wherein the glow bar and the motor(s) are adapted to be operated by the same said battery or batteries.

17. A personal smoking unit according to any preceding claim, wherein the housing is also provided with air inlet means to enable air to enter the housing so as to
20 allow a cigarette within the housing to burn.

18. A personal smoking unit according to claim 17, wherein the air inlet means comprise one or more openings in the side of the housing.

19. A personal smoking unit according to claim 18, wherein each said opening is provided with a one-way valve to prevent combustion products from escap-
25 ing the housing.

20. A personal smoking unit according to claim 2 or any of claims 3 to 19 when dependant on claim 2, further provided with a non-return valve adjacent the inhale mouthpiece and adapted to be operated automatically or by the user in order to open a passageway within the inhale mouthpiece, thereby allowing the user to inhale
30 from the cigarette.

- 8 -

21. A personal smoking unit according to claim 2 or any of claims 3 to 19 when dependant on claim 2, further provided with an automatic one-way valve positioned within the inhale mouthpiece in order to open a passageway within the inhale mouthpiece, thereby allowing the user to inhale from the cigarette.

5 22. A personal smoking unit, substantially as herein described with reference to Figure 1 or Figure 2 or Figure 3 of the drawings.

1/3

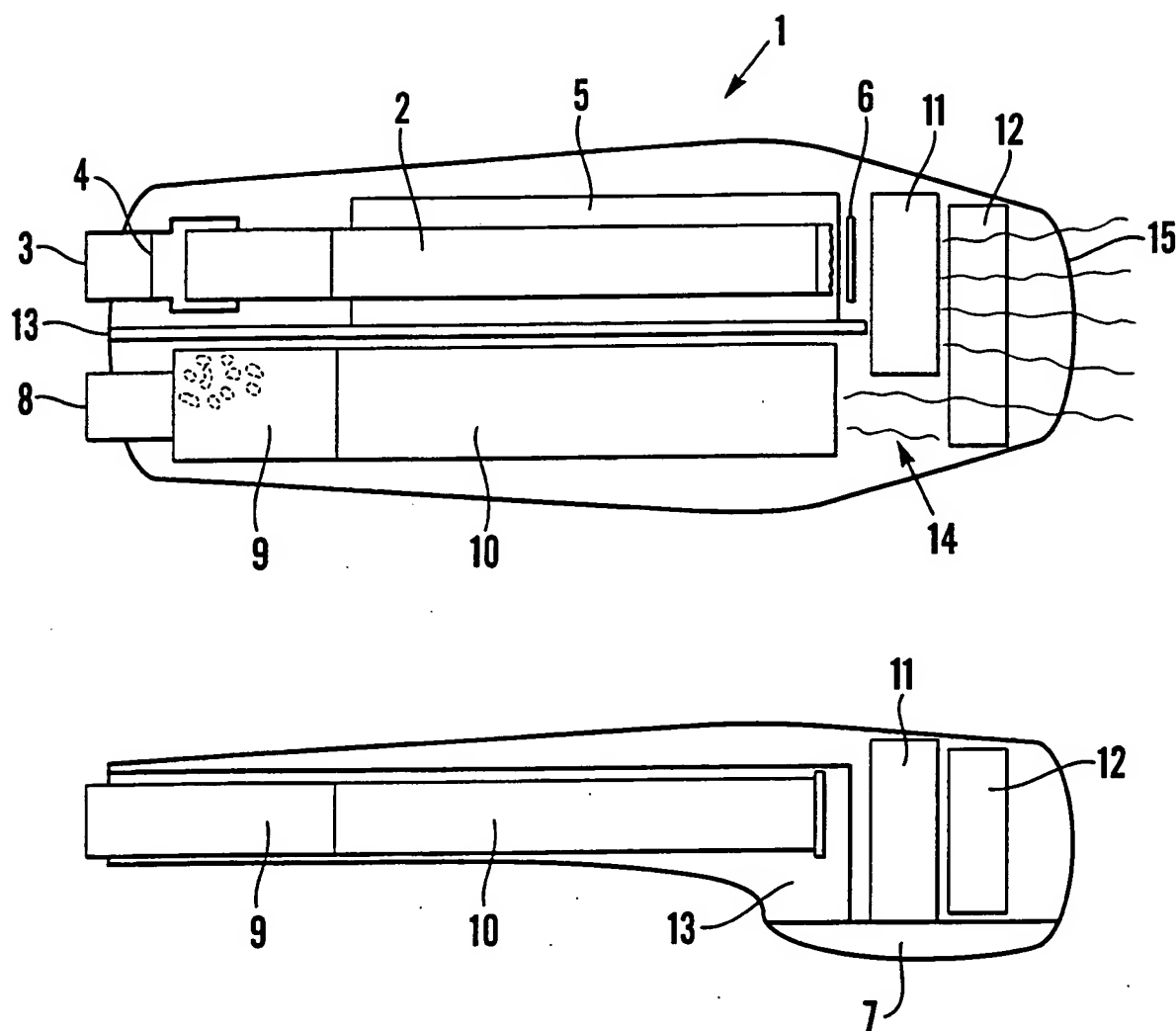


Fig. 1

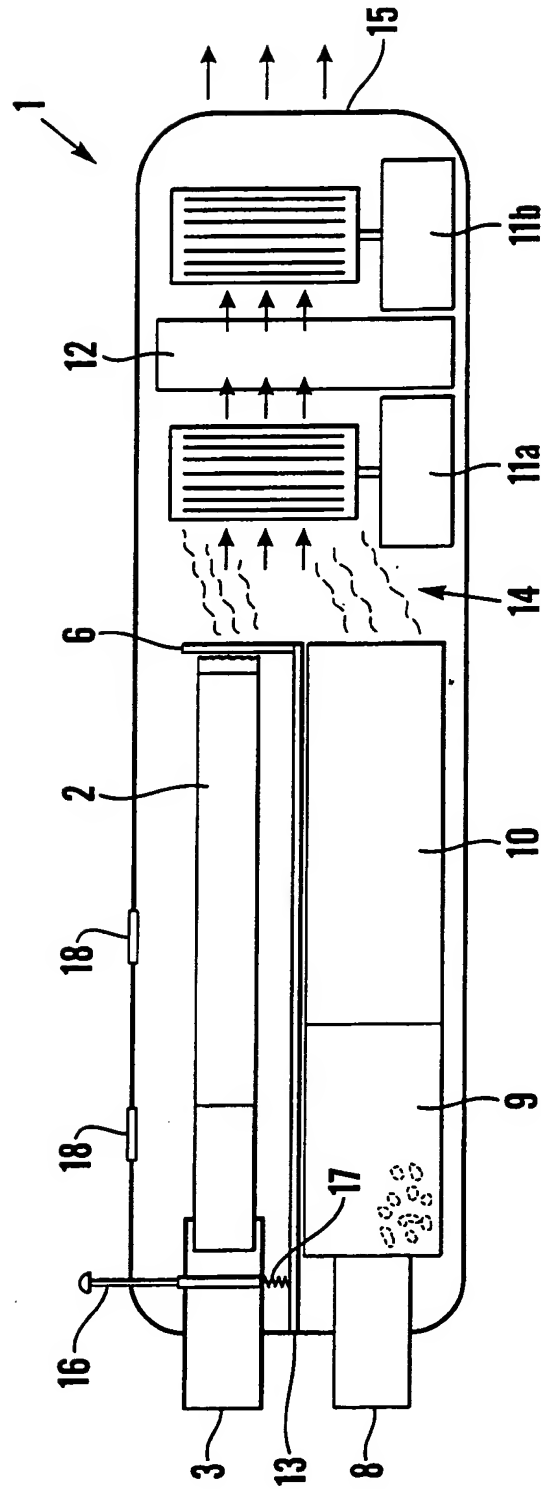


Fig.2

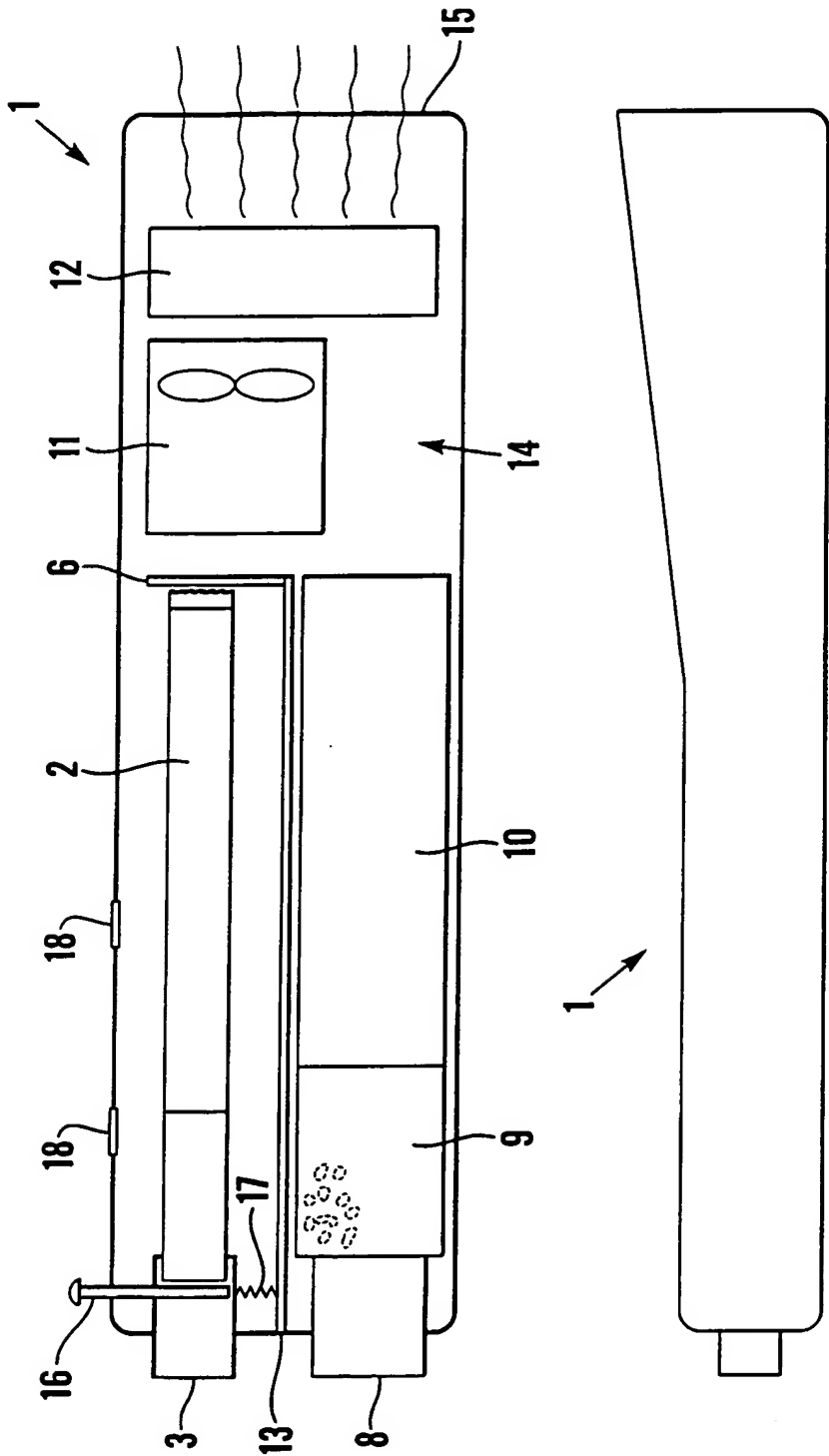


Fig.3

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/03256

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A24F13/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A24F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 495 859 A (BOWEN LARRY ET AL) 5 March 1996 (1996-03-05) the whole document	1-9, 11, 12, 17, 22
Y		10, 13-16, 19-21
X	US 5 752 527 A (BOWEN LARRY ET AL) 19 May 1998 (1998-05-19)	1-3, 5-9, 11-13, 15, 17, 22
Y	the whole document	4, 10, 14, 16, 18-21
Y	US 5 529 078 A (REHDER MILES R ET AL) 25 June 1996 (1996-06-25) column 3, line 62 - line 66; figure 2 -/--	10, 13-16, 19-21

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

19 January 2001

Date of mailing of the international search report

01/02/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

Pille, S

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/03256

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 388 595 A (SHAFER GARY A) 14 February 1995 (1995-02-14) column 2, line 16; figure 1 ---	18-21
Y	US 5 396 907 A (ROJAS HENAO JERRY ET AL) 14 March 1995 (1995-03-14) column 4, line 65 - line 68; figure 1 ---	18-20
Y	US 6 012 459 A (KEEFE WAYNE B) 11 January 2000 (2000-01-11) column 4, line 25 - line 31 ---	14-16
Y	US 5 469 870 A (MEADOR MURRAY P) 28 November 1995 (1995-11-28) figure 1 ---	4
X	DE 297 16 064 U (LASCZYK PETER) 8 January 1998 (1998-01-08) the whole document -----	1-3

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 00/03256

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5495859 A	05-03-1996	AT 163345 T	15-03-1998
		AT 163346 T	15-03-1998
		AU 681397 B	28-08-1997
		AU 6561794 A	08-11-1994
		AU 672702 B	10-10-1996
		AU 6673994 A	08-11-1994
		CA 2121282 A,C	15-10-1994
		CA 2121289 A,C	15-10-1994
		WO 9423599 A	27-10-1994
		WO 9423600 A	27-10-1994
		CN 1124445 A	12-06-1996
		CN 1124914 A	19-06-1996
		DE 69408660 D	02-04-1998
		DE 69408660 T	30-07-1998
		DE 69408661 D	02-04-1998
		DE 69408661 T	17-09-1998
		DK 693887 T	04-05-1998
		DK 693888 T	23-09-1998
		EP 0693887 A	31-01-1996
		EP 0693888 A	31-01-1996
		FI 954872 A	30-11-1995
		FI 954873 A	30-11-1995
		HK 1008719 A	14-05-1999
		HK 1008720 A	14-05-1999
		JP 2944219 B	30-08-1999
		JP 8508411 T	10-09-1996
		JP 8508646 T	17-09-1996
		NO 954041 A	13-12-1995
		NO 954042 A	14-12-1995
		NZ 265233 A	24-06-1997
		NZ 265585 A	24-06-1997
		RU 2096978 C	27-11-1997
		RU 2114539 C	10-07-1998
		SG 49708 A	15-06-1998
		SG 49259 A	18-05-1998
		US 5497791 A	12-03-1996
		US 5638833 A	17-06-1997
		US 5752527 A	19-05-1998
		ZA 9402403 A	02-02-1995
US 5752527 A	19-05-1998	AT 163345 T	15-03-1998
		AT 163346 T	15-03-1998
		AU 681397 B	28-08-1997
		AU 6561794 A	08-11-1994
		AU 672702 B	10-10-1996
		AU 6673994 A	08-11-1994
		CA 2121282 A,C	15-10-1994
		CA 2121289 A,C	15-10-1994
		WO 9423599 A	27-10-1994
		WO 9423600 A	27-10-1994
		CN 1124445 A	12-06-1996
		CN 1124914 A	19-06-1996
		DE 69408660 D	02-04-1998
		DE 69408660 T	30-07-1998
		DE 69408661 D	02-04-1998
		DE 69408661 T	17-09-1998
		DK 693887 T	04-05-1998
		DK 693888 T	23-09-1998

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 00/03256

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5752527 A		EP 0693887 A	31-01-1996
		EP 0693888 A	31-01-1996
		FI 954872 A	30-11-1995
		FI 954873 A	30-11-1995
		HK 1008719 A	14-05-1999
		HK 1008720 A	14-05-1999
		JP 2944219 B	30-08-1999
		JP 8508411 T	10-09-1996
		JP 8508646 T	17-09-1996
		NO 954041 A	13-12-1995
		NO 954042 A	14-12-1995
		NZ 265233 A	24-06-1997
		NZ 265585 A	24-06-1997
		RU 2096978 C	27-11-1997
		RU 2114539 C	10-07-1998
		SG 49708 A	15-06-1998
		SG 49259 A	18-05-1998
		US 5497791 A	12-03-1996
		US 5495859 A	05-03-1996
		US 5638833 A	17-06-1997
		ZA 9402403 A	02-02-1995
US 5529078 A	25-06-1996	NONE	
US 5388595 A	14-02-1995	NONE	
US 5396907 A	14-03-1995	AU 7330094 A	20-02-1995
		WO 9502970 A	02-02-1995
US 6012459 A	11-01-2000	AU 2505799 A	30-08-1999
		WO 9940806 A	19-08-1999
		EP 0973418 A	26-01-2000
US 5469870 A	28-11-1995	NONE	
DE 29716064 U	08-01-1998	NONE	